

THE POINT – SOUTH CD PACKAGE #1

ROLESVILLE, NORTH CAROLINA

WATER DISTRIBUTION CALCULATIONS

PROJECT NUMBER: AWH-20000
DESIGNED BY: W. T. O'DANIEL, PE

DATE: FEBRUARY 5, 2020



MCADAMS

2905 MERIDIAN PARKWAY
DURHAM, NORTH CAROLINA 27713
NC Lic. # C-0293

THE POINT – SOUTH CD PACKAGE #1

WATER DISTRIBUTION SYSTEM CALCULATIONS

GENERAL DESCRIPTION

The proposed development currently known as The Point - South, is situated on approximately 264.27 acres and is located on the South side of NC 401 (Louisburg Road and west of E. Young Street in Rolesville, North Carolina. Proposed development on this site consists of the construction of 319 Townhomes and 485 Single Family Residential homes, along with supporting street, parking, utility, storm drainage improvements, and other supporting infrastructure.

The proposed water system will extend from an existing 12-inch water main E. Young Street. The proposed water system will extend through the proposed development to serve 804 total residential lots. The internal water network will consist of a 12-inch, 8-inch and 6-inch DIP pipe grid. The fire protection system for the proposed development consists of 39 new Fire Hydrants.

The following report analyzes the fire flow capacity of the proposed water distribution system along with the domestic demand for the proposed CD Package #1 portion of the development. See “The Point - South Overall Water Distribution Report” for the entire “The Point – South” proposed development.

CALCULATION METHODOLOGY

- > The proposed water system was analyzed using the Bentley WaterCAD Connect Edition 3. The water system was modeled by entering data of the lengths, diameters, and elevations of the water mains.
- > The water system was simulated by modeling a pump at an existing hydrant located along E. Young Street near Quarry Road directly in front of the site.
- > The fire flow data was based on a hydrant flow test conducted on March 28, 2019 and was provided by Withers Ravenel. The data from this flow test can be reviewed in the appropriate section of this report. This test data was used to model the pump simulation with recorded flows and pressures to form a 3-point pump curve.
- > The system minor head losses for items including bends, gate valves, check valves, and tees are accounted for in the model.

WATER DISTRIBUTION MODEL

The proposed development consists of infrastructure to support the proposed 266 new single family residential lots for CD Package #1. The fire flow requirement at each hydrant per the NC Fire Code – Appendix B is a minimum of 1,500 gpm at 20 psi.

Within the proposed development, there will be 266 residential water connections yielding an estimated peak domestic demand of 148 gpm. The domestic demands were calculated by using the North Carolina Division of Environment and Natural Resources (NCDENR) 15A NCAC 18C 0.0409 Service Connection Regulation. Since the Service Connection utilizes domestic taps of 400 gpd/residential unit, this value was used for each residential dwelling. The 400 gpd/residential unit represents the average daily flow (ADF) demand for a residential unit. The “Residential Demands” calculations table shows the results of the domestic demands for the connections added to each node in the model. A peaking factor of 2 has been included in these calculations as required by 15A NCAC 18C.

An estimate of 40 gpm was also added for amenities on the site bringing the total domestic demand to 188 gpm.

The minimum fire flow calculated with a minimum pressure of 20 psi residual pressure is as follows: 1,819 gpm at 20 psi residual pressure located at H-36.

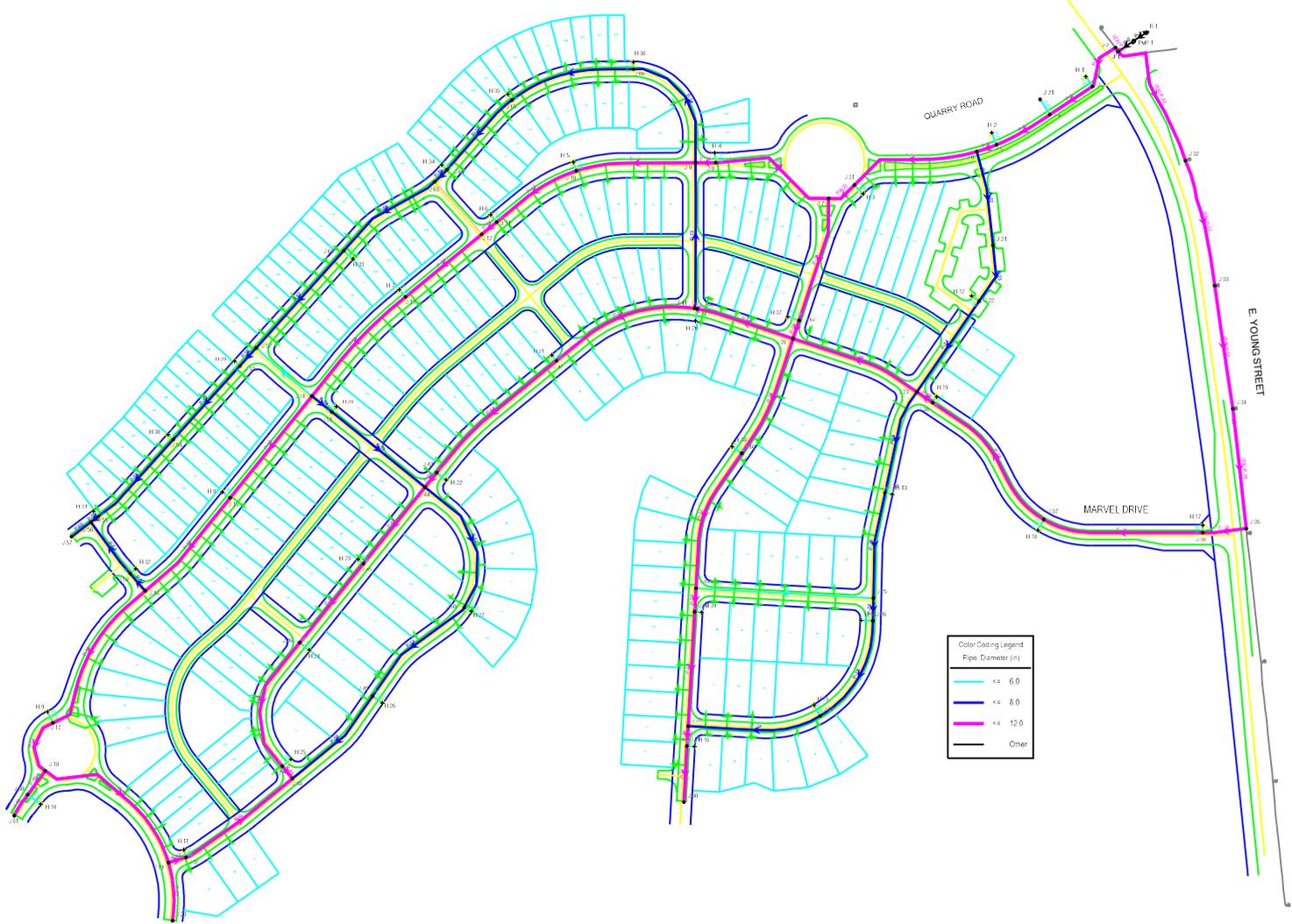
CONCLUSION

The most critical fire flow results occur at Hydrant H-36 with a fire flow of 1,819 gpm at 20 psi., meeting the NC Fire Code – Appendix B minimum fire flow requirement of 1,500 gpm.

The conclusion of this preliminary analysis is that the proposed water distribution system meets the NC Fire Code – Appendix B fire flow and pressure requirements.

WATER DISTRIBUTION MAP

Scenario: Base



FIRE HYDRANT TEST



TEST LOCATION

Address/Location Description E Young St. and Quarry Rd. Intersection

TEST 3

Test hydrant Facility ID WHYD 124463

Flow hydrant Facility ID WHYD 124462

APPLICATION INFORMATION

Name WithersRavenel, Inc.

Address 115 MacKenan Drive Cary, NC 27511

Contact Person Clark Maness Phone (919)535-5213

Email cmaness@withersravenel.com

SYSTEM INFORMATION

Test Date 3/28/19

Time of Test 9:12AM

Nearest Elevated Tank Rolesville Tank

Test Hydrant Elevation 411ft

Main Size 12-inch

Pressure Zone Rolesville

Tank Hydraulic Grade 546.33'

Use 20ft below pressure zone (tank overflow) for design*

Pump Info Pump 2, RUMMIN

Theoretical Pressure 59 psi

RESULTS

Static Pressure 60 psi

Number of Outlets Flowing 2

Residual Pressure 46 psi

Flow Hydrant Discharge Pressure 13, 14 psi

Outlet Diameter 2 1/2 inches

Volume of Discharge 1,211 gpm

Water usage during test ~3,000 Total Gal

Test Completed by: Mike Blalock

SEAL (if applicable)

Testing Company: WithersRavenel, Inc.

Witnessed by: _____

Date 3/28/19



Notes: Rolesville / CORPUD staff witness not required.

- Please attach the following supporting documentation to this form;
- Labeled map of location of test identifying test hydrant and flow hydrant
- Calculation demonstrating how the discharge flow was determined
- Calculation demonstrating the available fire flow at a residual pressure of 20 psi
- Printout of any recorded data supporting the static and residual pressure at the test hydrant.
- Printout of any recorded data supporting the discharge pressure of the flow hydrant.

*To maintain system water quality, storage tanks may be maintained as low as 20' below overflow.

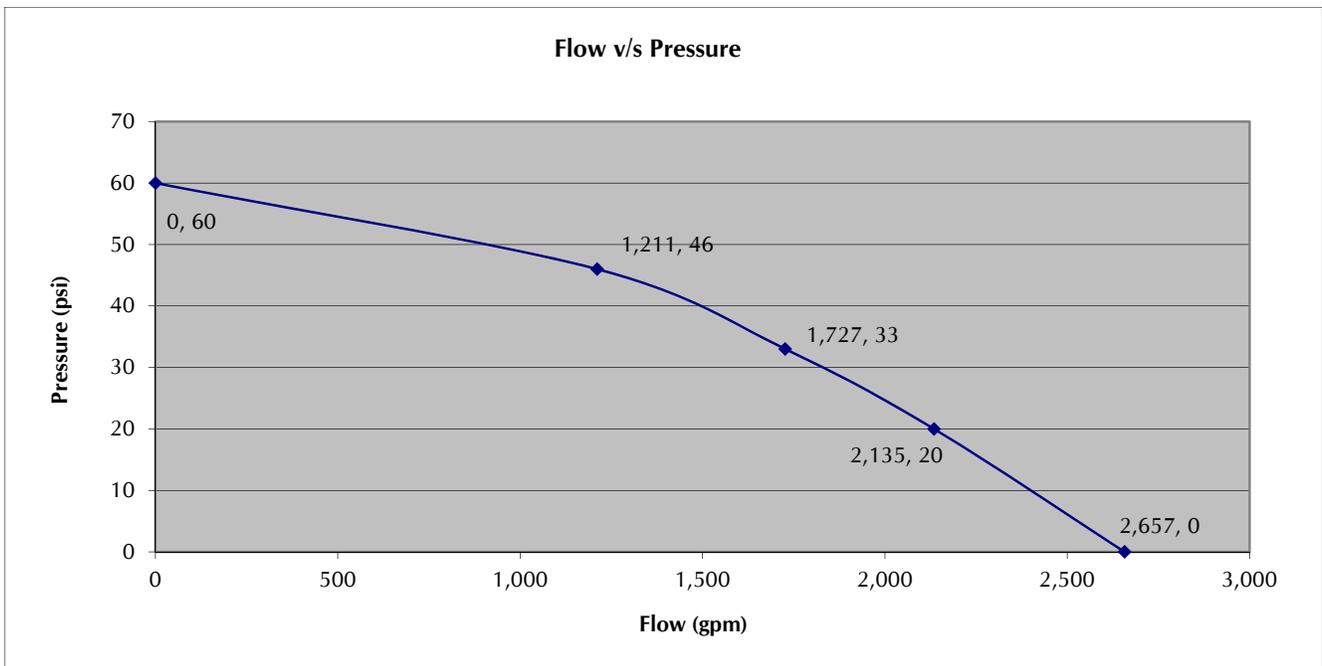
FIRE FLOW TEST DATA

Project Name	Rolesville PUD
WR Project #	02180280.00
Test Date	March 28, 2019
Flow Hydrant Location	Test 3. See attached map.
Pressure Hydrant Location	Test 3. See attached map.

Test Hydrant Static Pressure (psi)	60
Test Hydrant Residual Pressure (psi)	46
Nozzle 1 Pressure (psi)	13
Nozzle 1 Flow (gpm)	594
Nozzle 2 Pressure (psi)	14
Nozzle 2 Flow (gpm)	617
Calculated Flow (gpm)	1,211
Pressure Drop (psi)	14

Flow/Pressure Relationship	Flow (gpm)	Pressure (psi)
	0	60
	1,211	46
	1,727	33
	2,135	20
	2,657	0

Pump Curve	Flow (gpm)	Head (ft)
	0	139
	1,211	106
	1,727	76
	2,135	46
	2,657	0





Information depicted herein is for reference purposes only and is compiled from the best available sources. The City of Raleigh assumes no responsibility for errors arising from the misuse of this map.

City of Raleigh, Public Utilities

Louisburg Rd and Young St



PUMP SIMULATION REPORT

Pump Definition Detailed Report: Hydrant Test #3

Element Details

ID	267	Notes
Label	Hydrant Test #3	

Pump Curve

Flow (gpm)	Head (ft)
0	139.00
1,211	106.00
1,727	76.00
2,135	46.00
2,657	0.00

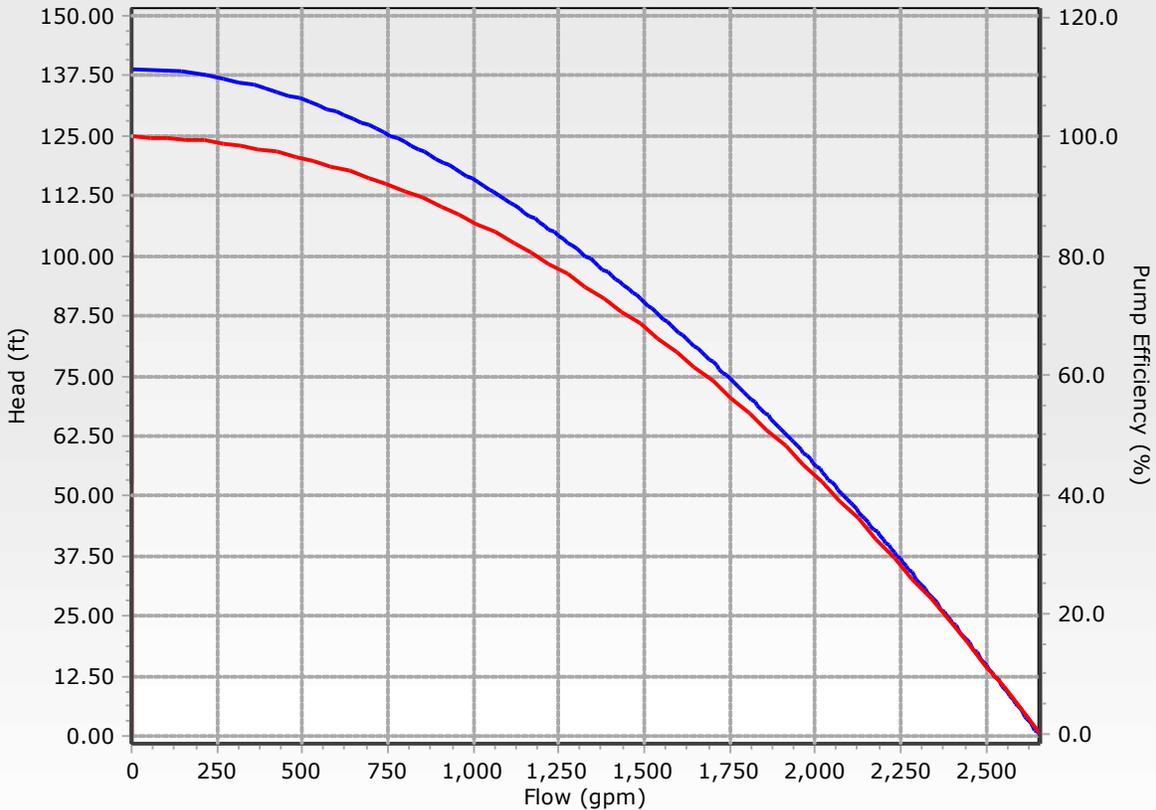
Pump Efficiency Type

Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0 gpm		

Transient (Physical)

Inertia (Pump and Motor)	0.000 lb·ft ²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Graph



JUNCTION REPORT

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
33	J-1	412.00	0	549.90	60
35	J-2	412.00	0	549.89	60
37	J-3	409.00	0	549.88	61
39	J-4	408.50	0	549.88	61
41	J-5	409.00	0	549.87	61
43	J-6	408.00	0	549.87	61
45	J-7	400.50	3	549.86	65
47	J-8	398.50	0	549.85	65
49	J-9	398.00	3	549.85	66
51	J-10	394.80	0	549.85	67
53	J-11	389.20	0	549.85	70
55	J-12	388.50	6	549.85	70
57	J-13	385.00	0	549.85	71
59	J-14	376.50	7	549.85	75
61	J-15	369.10	0	549.84	78
63	J-16	362.10	8	549.84	81
65	J-17	351.50	0	549.84	86
67	J-18	352.00	4	549.84	86
69	J-19	355.00	4	549.84	84
71	J-20	354.00	0	549.84	85
73	J-21	404.50	20	549.86	63
75	J-22	401.10	0	549.86	64
77	J-23	396.00	2	549.86	67
79	J-24	391.00	0	549.86	69
81	J-25	384.00	3	549.86	72
83	J-26	382.00	0	549.86	73
85	J-27	371.70	0	549.86	77
87	J-28	365.50	8	549.86	80
89	J-29	364.90	0	549.86	80
91	J-30	362.90	1	549.86	81
93	J-31	400.50	0	549.86	65
96	J-32	401.00	0	549.89	64
98	J-33	399.20	0	549.89	65
100	J-34	393.00	0	549.88	68
102	J-35	381.70	0	549.88	73
104	J-36	381.30	0	549.87	73
106	J-37	388.80	0	549.87	70
108	J-38	395.30	0	549.86	67
111	J-39	393.30	4	549.86	68
113	J-40	390.90	0	549.85	69
115	J-41	390.80	4	549.85	69
117	J-42	383.20	6	549.85	72
119	J-43	381.00	0	549.85	73
121	J-44	379.50	7	549.85	74
123	J-45	370.50	0	549.85	78
125	J-46	366.50	6	549.84	79
127	J-47	364.00	0	549.84	80
129	J-48	364.00	14	549.84	80
131	J-49	366.00	0	549.84	80

FlexTable: Junction Table

ID	Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
133	J-50	372.00	0	549.85	77
136	J-51	376.80	0	549.85	75
139	J-52	376.10	15	549.84	75
141	J-53	374.00	0	549.84	76
143	J-54	372.20	0	549.84	77
145	J-55	366.00	0	549.84	80
147	J-56	365.00	14	549.84	80
149	J-57	362.90	0	549.84	81
151	J-58	362.50	0	549.84	81
154	J-59	354.80	0	549.84	84
157	J-60	352.30	0	549.84	85
159	J-61	353.00	0	549.84	85
161	J-62	390.60	0	549.84	69
163	J-63	391.00	16	549.84	69
165	J-64	390.10	0	549.84	69
167	J-65	393.00	0	549.85	68
169	J-66	402.50	0	549.85	64
173	J-67	394.50	0	549.86	67
176	J-68	383.70	0	549.86	72
178	J-69	370.30	13	549.86	78
180	J-70	369.00	0	549.86	78
184	J-71	411.00	20	549.88	60

HYDRANT REPORT

FlexTable: Hydrant Table

Label	Hydrant Status	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
H-1	Closed	408.50	0	549.88	61
H-2	Closed	409.00	0	549.87	61
H-3	Closed	401.00	0	549.86	64
H-4	Closed	399.00	0	549.85	65
H-5	Closed	395.30	0	549.85	67
H-6	Closed	389.70	0	549.85	69
H-7	Closed	385.50	0	549.85	71
H-8	Closed	369.60	0	549.84	78
H-9	Closed	352.00	0	549.84	86
H-10	Closed	353.00	0	549.84	85
H-11	Closed	355.00	0	549.84	84
H-12	Closed	401.60	0	549.86	64
H-13	Closed	391.50	0	549.86	69
H-14	Closed	382.50	0	549.86	72
H-15	Closed	372.10	0	549.86	77
H-16	Closed	365.40	0	549.86	80
H-17	Closed	381.80	0	549.87	73
H-18	Closed	389.20	0	549.87	70
H-19	Closed	395.80	0	549.86	67
H-20	Closed	391.20	0	549.85	69
H-21	Closed	383.70	0	549.85	72
H-22	Closed	381.30	0	549.85	73
H-23	Closed	371.00	0	549.85	77
H-24	Closed	367.00	0	549.84	79
H-25	Closed	364.50	0	549.84	80
H-26	Closed	366.50	0	549.84	79
H-27	Closed	372.50	0	549.85	77
H-28	Closed	377.30	0	549.85	75
H-29	Closed	374.50	0	549.84	76
H-30	Closed	372.70	0	549.84	77
H-31	Closed	366.50	0	549.84	79
H-32	Closed	363.00	0	549.84	81
H-33	Closed	391.10	0	549.84	69
H-34	Closed	390.60	0	549.84	69
H-35	Closed	393.50	0	549.85	68
H-36	Closed	402.90	0	549.85	64
H-37	Closed	395.00	0	549.86	67
H-38	Closed	384.20	0	549.86	72
H-39	Closed	369.50	0	549.86	78

PIPE REPORT

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Unified)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
P-1	37	R-1	PMP-1	24.0	Ductile Iron	150.0	0.000	188	0.13	0.00
P-2	44	PMP-1	J-1	24.0	Ductile Iron	150.0	0.000	188	0.13	0.00
(EX) P-3	12	J-1	J-2	12.0	Ductile Iron	130.0	0.000	125	0.36	0.00
P-4	118	J-2	J-3	12.0	Ductile Iron	130.0	1.870	125	0.36	0.01
P-5	123	J-3	J-4	12.0	Ductile Iron	130.0	0.350	125	0.36	0.01
P-6	148	J-4	J-5	12.0	Ductile Iron	130.0	0.350	105	0.30	0.01
P-7	50	J-5	J-6	12.0	Ductile Iron	130.0	0.740	105	0.30	0.00
P-9	313	J-7	J-8	12.0	Ductile Iron	130.0	1.140	56	0.16	0.00
P-10	48	J-8	J-9	12.0	Ductile Iron	130.0	0.890	56	0.16	0.00
P-11	289	J-9	J-10	12.0	Ductile Iron	130.0	0.740	40	0.11	0.00
P-12	229	J-10	J-11	12.0	Ductile Iron	130.0	0.350	40	0.11	0.00
P-13	47	J-11	J-12	12.0	Ductile Iron	130.0	0.740	40	0.11	0.00
P-14	237	J-12	J-13	12.0	Ductile Iron	130.0	0.740	34	0.10	0.00
P-15	329	J-13	J-14	12.0	Ductile Iron	130.0	0.890	34	0.10	0.00
P-16	315	J-14	J-15	12.0	Ductile Iron	130.0	1.670	22	0.06	0.00
P-17	303	J-15	J-16	12.0	Ductile Iron	130.0	0.790	22	0.06	0.00
P-18	403	J-16	J-17	12.0	Ductile Iron	130.0	0.940	-1	0.00	0.00
P-19	144	J-17	J-18	12.0	Ductile Iron	130.0	1.340	-1	0.00	0.00
P-20	410	J-18	J-19	12.0	Ductile Iron	130.0	1.530	-5	0.01	0.00
P-21	141	J-19	J-20	12.0	Ductile Iron	130.0	0.740	0	0.00	0.00
P-22	230	J-6	J-21	8.0	Ductile Iron	130.0	1.670	27	0.17	0.01
P-23	147	J-21	J-22	8.0	Ductile Iron	130.0	0.550	7	0.05	0.00
P-24	264	J-22	J-23	8.0	Ductile Iron	130.0	0.740	7	0.05	0.00
P-25	257	J-23	J-24	8.0	Ductile Iron	130.0	1.140	14	0.09	0.00
P-26	256	J-24	J-25	8.0	Ductile Iron	130.0	0.400	14	0.09	0.00
P-27	55	J-25	J-26	8.0	Ductile Iron	130.0	0.740	7	0.04	0.00
P-28	274	J-26	J-27	8.0	Ductile Iron	130.0	0.350	7	0.04	0.00
P-29	324	J-27	J-28	8.0	Ductile Iron	130.0	1.670	7	0.04	0.00
P-30	48	J-28	J-29	12.0	Ductile Iron	130.0	0.740	1	0.00	0.00
P-31	135	J-29	J-30	12.0	Ductile Iron	130.0	0.000	1	0.00	0.00
P-8(1)	321	J-6	J-31	12.0	Ductile Iron	130.0	0.940	78	0.22	0.01
P-8(2)	76	J-31	J-7	12.0	Ductile Iron	130.0	0.940	78	0.22	0.00
(EX) P-32	349	J-1	J-32	12.0	Ductile Iron	130.0	0.000	63	0.18	0.01

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Unified)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
(EX) P-33	310	J-32	J-33	12.0	Ductile Iron	130.0	0.000	63	0.18	0.00
(EX) P-34	299	J-33	J-34	12.0	Ductile Iron	130.0	0.000	63	0.18	0.00
(EX) P-35	289	J-34	J-35	12.0	Ductile Iron	130.0	0.000	63	0.18	0.00
P-36	105	J-35	J-36	12.0	Ductile Iron	130.0	1.330	63	0.18	0.00
P-37	388	J-36	J-37	12.0	Ductile Iron	130.0	0.350	63	0.18	0.01
P-38	395	J-37	J-38	12.0	Ductile Iron	130.0	0.350	63	0.18	0.01
P-39	45	J-38	J-23	12.0	Ductile Iron	130.0	1.140	63	0.18	0.00
P-40	326	J-23	J-39	12.0	Ductile Iron	130.0	1.530	54	0.15	0.00
P-41	241	J-39	J-40	12.0	Ductile Iron	130.0	0.890	58	0.17	0.00
P-42	7	J-40	J-41	12.0	Ductile Iron	130.0	0.740	58	0.17	0.00
P-43	369	J-41	J-42	12.0	Ductile Iron	130.0	0.740	48	0.14	0.00
P-44	395	J-42	J-43	12.0	Ductile Iron	130.0	0.350	42	0.12	0.00
P-45	45	J-43	J-44	12.0	Ductile Iron	130.0	0.890	42	0.12	0.00
P-46	236	J-44	J-45	12.0	Ductile Iron	130.0	0.740	23	0.06	0.00
P-47	244	J-45	J-46	12.0	Ductile Iron	130.0	0.350	23	0.06	0.00
P-48	344	J-46	J-47	12.0	Ductile Iron	130.0	0.450	17	0.05	0.00
P-49	38	J-47	J-48	12.0	Ductile Iron	130.0	1.670	17	0.05	0.00
P-50	279	J-48	J-49	8.0	Ductile Iron	130.0	0.790	-7	0.04	0.00
P-51	311	J-49	J-50	8.0	Ductile Iron	130.0	0.400	-7	0.04	0.00
P-52	347	J-50	J-44	8.0	Ductile Iron	130.0	0.890	-7	0.04	0.00
P-53	287	J-44	J-51	8.0	Ductile Iron	130.0	1.140	6	0.04	0.00
P-54	62	J-51	J-14	8.0	Ductile Iron	130.0	0.740	6	0.04	0.00
P-55	178	J-14	J-52	6.0	Ductile Iron	130.0	1.530	11	0.13	0.00
P-56	59	J-52	J-53	8.0	Ductile Iron	130.0	0.740	-1	0.01	0.00
P-57	239	J-53	J-54	8.0	Ductile Iron	130.0	0.350	-1	0.01	0.00
P-58	260	J-54	J-55	8.0	Ductile Iron	130.0	0.400	-1	0.01	0.00
P-59	21	J-55	J-56	8.0	Ductile Iron	130.0	0.740	-1	0.01	0.00
P-60	59	J-56	J-57	8.0	Ductile Iron	130.0	0.740	0	0.00	0.00
P-61	156	J-56	J-58	8.0	Ductile Iron	130.0	1.670	-16	0.10	0.00
P-62	55	J-58	J-16	8.0	Ductile Iron	130.0	0.740	-16	0.10	0.00
P-63	44	J-19	J-59	12.0	Ductile Iron	130.0	1.670	-10	0.03	0.00
P-64	319	J-59	J-48	12.0	Ductile Iron	130.0	0.790	-10	0.03	0.00
P-65	71	J-18	J-60	12.0	Ductile Iron	130.0	1.670	0	0.00	0.00

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Unified)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
P-66	60	J-60	J-61	12.0	Ductile Iron	130.0	0.350	0	0.00	0.00
P-67	314	J-52	J-62	8.0	Ductile Iron	130.0	0.740	-2	0.02	0.00
P-68	278	J-62	J-63	8.0	Ductile Iron	130.0	0.840	-2	0.02	0.00
P-69	41	J-63	J-64	8.0	Ductile Iron	130.0	0.740	-19	0.12	0.00
P-70	229	J-64	J-65	8.0	Ductile Iron	130.0	0.350	-19	0.12	0.00
P-71	309	J-65	J-66	8.0	Ductile Iron	130.0	0.350	-19	0.12	0.00
P-72	311	J-66	J-9	8.0	Ductile Iron	130.0	0.940	-19	0.12	0.00
P-73	350	J-9	J-41	8.0	Ductile Iron	130.0	1.530	-6	0.04	0.00
P-74	304	J-7	J-67	12.0	Ductile Iron	130.0	1.720	19	0.06	0.00
P-75	46	J-67	J-39	12.0	Ductile Iron	130.0	0.890	19	0.06	0.00
P-76	304	J-39	J-68	12.0	Ductile Iron	130.0	0.740	11	0.03	0.00
P-77	353	J-68	J-69	12.0	Ductile Iron	130.0	0.740	11	0.03	0.00
P-78	57	J-69	J-70	12.0	Ductile Iron	130.0	0.740	2	0.01	0.00
P-79	275	J-70	J-28	12.0	Ductile Iron	130.0	0.740	2	0.01	0.00
P-80	427	J-69	J-25	6.0	Ductile Iron	130.0	2.060	-4	0.04	0.00
P-81	43	J-4	J-71	6.0	Ductile Iron	130.0	0.000	20	0.23	0.00
P-82	29	J-3	H-1	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-83	31	J-5	H-2	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-84	30	J-31	H-3	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-85	23	J-8	H-4	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-86	23	J-10	H-5	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-87	22	J-11	H-6	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-88	23	J-13	H-7	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-89	23	J-15	H-8	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-90	30	J-17	H-9	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-91	38	J-60	H-10	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-92	19	J-59	H-11	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-93	22	J-22	H-12	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-94	17	J-24	H-13	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-95	29	J-26	H-14	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-96	29	J-27	H-15	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-97	18	J-29	H-16	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-98	18	J-36	H-17	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00

FlexTable: Pipe Table

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Material	Hazen-Williams C	Minor Loss Coefficient (Unified)	Flow (gpm)	Velocity (ft/s)	Headloss (ft)
P-99	30	J-37	H-18	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-100	17	J-38	H-19	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-101	29	J-40	H-20	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-102	17	J-42	H-21	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-103	29	J-43	H-22	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-104	17	J-45	H-23	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-105	30	J-46	H-24	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-106	27	J-47	H-25	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-107	29	J-49	H-26	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-108	19	J-50	H-27	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-109	18	J-51	H-28	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-110	17	J-53	H-29	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-111	17	J-54	H-30	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-112	17	J-55	H-31	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-113	17	J-58	H-32	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-114	30	J-62	H-33	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-115	17	J-64	H-34	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-116	17	J-65	H-35	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-117	17	J-66	H-36	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-118	29	J-67	H-37	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-119	30	J-68	H-38	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00
P-120	17	J-70	H-39	6.0	Ductile Iron	130.0	0.000	0	0.00	0.00

FIRE FLOW ANALYSIS REPORT

Fire Flow Node FlexTable: Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (System Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)
H-1	True	1,500	1,881	1,500	1,881	20	20	22	J-71
H-2	True	1,500	1,855	1,500	1,855	20	20	23	J-71
H-3	True	1,500	1,934	1,500	1,934	20	20	20	J-71
H-4	True	1,500	1,936	1,500	1,936	21	20	20	J-71
H-5	True	1,500	1,936	1,500	1,936	22	20	20	J-71
H-6	True	1,500	1,936	1,500	1,936	24	20	20	J-71
H-7	True	1,500	1,936	1,500	1,936	26	20	20	J-71
H-8	True	1,500	1,936	1,500	1,936	32	20	20	J-71
H-9	True	1,500	1,935	1,500	1,935	38	20	20	J-71
H-10	True	1,500	1,936	1,500	1,936	36	20	20	J-71
H-11	True	1,500	1,935	1,500	1,935	38	20	20	J-71
H-12	True	1,500	1,893	1,500	1,893	20	20	21	J-71
H-13	True	1,500	1,937	1,500	1,937	22	20	20	J-71
H-14	True	1,500	1,937	1,500	1,937	24	20	20	J-71
H-15	True	1,500	1,937	1,500	1,937	28	20	20	J-71
H-16	True	1,500	1,937	1,500	1,937	34	20	20	J-71
H-17	True	1,500	1,943	1,500	1,943	29	20	20	J-2
H-18	True	1,500	1,942	1,500	1,942	25	20	20	J-71
H-19	True	1,500	1,939	1,500	1,939	23	20	20	J-71
H-20	True	1,500	1,936	1,500	1,936	24	20	20	J-71
H-21	True	1,500	1,936	1,500	1,936	27	20	20	J-71
H-22	True	1,500	1,936	1,500	1,936	27	20	20	J-71
H-23	True	1,500	1,936	1,500	1,936	32	20	20	J-71
H-24	True	1,500	1,936	1,500	1,936	32	20	20	J-71
H-25	True	1,500	1,936	1,500	1,936	34	20	20	J-71
H-26	True	1,500	1,936	1,500	1,936	30	20	20	J-71
H-27	True	1,500	1,936	1,500	1,936	28	20	20	J-71
H-28	True	1,500	1,936	1,500	1,936	29	20	20	J-71
H-29	True	1,500	1,936	1,500	1,936	27	20	20	J-71
H-30	True	1,500	1,936	1,500	1,936	27	20	20	J-71
H-31	True	1,500	1,936	1,500	1,936	31	20	20	J-71

Fire Flow Node FlexTable: Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (System Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)
H-32	True	1,500	1,936	1,500	1,936	34	20	20	J-71
H-33	True	1,500	1,869	1,500	1,869	20	20	22	J-71
H-34	True	1,500	1,890	1,500	1,890	20	20	21	H-36
H-35	True	1,500	1,873	1,500	1,873	20	20	21	H-36
H-36	True	1,500	1,819	1,500	1,819	20	20	22	J-66
H-37	True	1,500	1,936	1,500	1,936	22	20	20	J-71
H-38	True	1,500	1,937	1,500	1,937	26	20	20	J-71
H-39	True	1,500	1,937	1,500	1,937	33	20	20	J-71
J-1	True	1,500	1,944	1,500	1,944	20	20	20	J-2
J-2	True	1,500	1,942	1,500	1,942	20	20	20	J-1
J-3	True	1,500	1,937	1,500	1,937	21	20	20	J-71
J-4	True	1,500	1,929	1,500	1,929	21	20	20	J-71
J-5	True	1,500	1,931	1,500	1,931	20	20	20	J-71
J-6	True	1,500	1,933	1,500	1,933	21	20	20	J-71
J-7	True	1,500	1,935	1,503	1,938	23	20	20	J-71
J-8	True	1,500	1,936	1,500	1,936	24	20	20	J-71
J-9	True	1,500	1,936	1,503	1,939	24	20	20	J-71
J-10	True	1,500	1,936	1,500	1,936	25	20	20	J-71
J-11	True	1,500	1,936	1,500	1,936	27	20	20	J-71
J-12	True	1,500	1,936	1,506	1,941	27	20	20	J-71
J-13	True	1,500	1,936	1,500	1,936	28	20	20	J-71
J-14	True	1,500	1,936	1,507	1,942	32	20	20	J-71
J-15	True	1,500	1,936	1,500	1,936	35	20	20	J-71
J-16	True	1,500	1,935	1,508	1,943	38	20	20	J-71
J-17	True	1,500	1,935	1,500	1,935	42	20	20	J-71
J-18	True	1,500	1,935	1,504	1,939	42	20	20	J-71
J-19	True	1,500	1,935	1,504	1,940	40	20	20	J-71
J-20	True	1,500	1,935	1,500	1,935	40	20	20	J-71
J-21	True	1,500	1,922	1,520	1,942	20	20	20	J-71
J-22	True	1,500	1,935	1,500	1,935	21	20	20	J-71
J-23	True	1,500	1,938	1,502	1,940	25	20	20	J-71

Fire Flow Node FlexTable: Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (System Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)
J-24	True	1,500	1,937	1,500	1,937	24	20	20	J-71
J-25	True	1,500	1,937	1,503	1,940	27	20	20	J-71
J-26	True	1,500	1,937	1,500	1,937	27	20	20	J-71
J-27	True	1,500	1,937	1,500	1,937	31	20	20	J-71
J-28	True	1,500	1,937	1,508	1,944	36	20	20	J-71
J-29	True	1,500	1,937	1,500	1,937	36	20	20	J-71
J-30	True	1,500	1,937	1,501	1,938	36	20	20	J-71
J-31	True	1,500	1,935	1,500	1,935	23	20	20	J-71
J-32	True	1,500	1,944	1,500	1,944	24	20	20	J-2
J-33	True	1,500	1,944	1,500	1,944	24	20	20	J-2
J-34	True	1,500	1,943	1,500	1,943	27	20	20	J-2
J-35	True	1,500	1,943	1,500	1,943	31	20	20	J-2
J-36	True	1,500	1,943	1,500	1,943	31	20	20	J-2
J-37	True	1,500	1,942	1,500	1,942	28	20	20	J-71
J-38	True	1,500	1,939	1,500	1,939	25	20	20	J-71
J-39	True	1,500	1,936	1,504	1,940	26	20	20	J-71
J-40	True	1,500	1,936	1,500	1,936	27	20	20	J-71
J-41	True	1,500	1,936	1,504	1,940	27	20	20	J-71
J-42	True	1,500	1,936	1,506	1,942	30	20	20	J-71
J-43	True	1,500	1,936	1,500	1,936	30	20	20	J-71
J-44	True	1,500	1,936	1,507	1,942	31	20	20	J-71
J-45	True	1,500	1,936	1,500	1,936	34	20	20	J-71
J-46	True	1,500	1,936	1,506	1,941	36	20	20	J-71
J-47	True	1,500	1,935	1,500	1,935	37	20	20	J-71
J-48	True	1,500	1,936	1,514	1,950	37	20	20	J-71
J-49	True	1,500	1,936	1,500	1,936	33	20	20	J-71
J-50	True	1,500	1,936	1,500	1,936	30	20	20	J-71
J-51	True	1,500	1,936	1,500	1,936	31	20	20	J-71
J-52	True	1,500	1,936	1,515	1,951	29	20	20	J-71
J-53	True	1,500	1,936	1,500	1,936	29	20	20	J-71
J-54	True	1,500	1,936	1,500	1,936	30	20	20	J-71

Fire Flow Node FlexTable: Fire Flow Report

Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (gpm)	Fire Flow (Available) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (System Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)
J-55	True	1,500	1,936	1,500	1,936	33	20	20	J-71
J-56	True	1,500	1,936	1,514	1,950	33	20	20	J-71
J-57	True	1,500	1,936	1,500	1,936	32	20	20	J-71
J-58	True	1,500	1,935	1,500	1,935	36	20	20	J-71
J-59	True	1,500	1,935	1,500	1,935	40	20	20	J-71
J-60	True	1,500	1,935	1,500	1,935	41	20	20	J-71
J-61	True	1,500	1,935	1,500	1,935	40	20	20	J-71
J-62	True	1,500	1,935	1,500	1,935	20	20	20	H-36
J-63	True	1,500	1,915	1,516	1,931	21	20	20	H-36
J-64	True	1,500	1,910	1,500	1,910	21	20	20	H-36
J-65	True	1,500	1,892	1,500	1,892	21	20	20	H-36
J-66	True	1,500	1,860	1,500	1,860	20	20	20	H-36
J-67	True	1,500	1,936	1,500	1,936	26	20	20	J-71
J-68	True	1,500	1,937	1,500	1,937	30	20	20	J-71
J-69	True	1,500	1,937	1,513	1,949	35	20	20	J-71
J-70	True	1,500	1,937	1,500	1,937	35	20	20	J-71
J-71	True	1,500	1,805	1,520	1,825	20	20	25	J-2

RESIDENTIAL WATER DEMANDS



RESIDENTIAL WATER DEMAND

Project Name: **The Point - South CD Package 1**
 Project Number: **AWH-20000**

Date: **15-Dec-20**

Total Number of Lots in Subdivision: 266

Average Daily Demand per Lot: 400 GPD (NCAC T15A: 18C .0409)

Peaking Factor: 2 (NCAC T15A: 18C .0409)

ESTIMATED DEMAND AT JUNCTIONS

Junction Number	Number of Connections	Average Daily Demand (GPD)	Peak Daily Demand (GPD)	Peak Demand (GPM)
J-7	5	2,000	4,000	2.8
J-9	6	2,400	4,800	3.3
J-12	10	4,000	8,000	5.6
J-14	12	4,800	9,600	6.7
J-16	14	5,600	11,200	7.8
J-18	7	2,800	5,600	3.9
J-19	8	3,200	6,400	4.4
J-23	3	1,200	2,400	1.7
J-25	6	2,400	4,800	3.3
J-28	14	5,600	11,200	7.8
J-30	2	800	1,600	1.1
J-39	7	2,800	5,600	3.9
J-41	8	3,200	6,400	4.4
J-42	11	4,400	8,800	6.1
J-44	12	4,800	9,600	6.7
J-46	10	4,000	8,000	5.6
J-48	26	10,400	20,800	14.4
J-52	27	10,800	21,600	15.0
J-56	26	10,400	20,800	14.4
J-63	29	11,600	23,200	16.1
J-69	23	9,200	18,400	12.8
		0	0	0.0
		0	0	0.0
		0	0	0.0
		0	0	0.0

TOTAL	266	106,400	212,800	147.8
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